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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,872	05/30/2006	Moritaka Kimura	1215.004	1441
<div>7590 Richard L. Sampson Samson & Associate Suite 510 50 Congress Street Boston, MA 02109</div>				
<div>04/27/2009</div>				
<div>EXAMINER</div>				
<div>WILLIAMS, CLAYTON R</div>				
<div>ART UNIT</div>		<div>PAPER NUMBER</div>		
<div>2457</div>				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/561,872

Applicant(s)

KIMURA ET AL.

Examiner

Clayton R. Williams

Art Unit

2457

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-18 are pending in this application per amendment.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/14/2009 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikio (JP 2000-020501: hereinafter Mikio), in view of Nickel et al. (20030005068: hereinafter Nickel), and further in view of Official Notice.

For claims 1, 3, 4, 7 and 11-14, Mikio discloses a system for the cross-correlation of data, comprising:

a plurality n of computers PC_i , n being a real number which is equal to or greater than 2, and i being an integer from 0 to $n-1$ ([0005]);

wherein said plurality n of computers PC_i are communicably coupled via a connector with a switch ([0010]);

each of said plurality n of computers PC_i further including a storage device configured for storing data X_i ([0022], lines 1-3, disclosure of nodes of parallel computing system with storage apparatus for holding portions of a data set);

data X_i being divisible into n partial data units $X_i(j)$, j being an integer from 0 to $n-1$; data X_i being divisible into n partial data units $X_i(k)$, k being an integer from 0 to $n-1$ ([0022], lines 6-15, disclosure of division of data sets for distribution to cluster nodes);

a computer PC_k , wherein computer PC_k is configured for cross-correlation processing of partial data $X_i(k)$ ([0022], lines 1-3, disclosure of nodes of parallel computing system with storage apparatus for holding portions of a data set);

wherein each computer PC_i of said plurality n is configured-to for a first exchange of a partial data unit with a partner computer chosen from said plurality n of computers, so that no more than one computer PC_i is idle during said first exchange ([0059], disclosure of nodes of parallel system operating in pairs to exchange data for processing); and

wherein each computer PC_i of said plurality n is configured for an additional exchange of additional partial data units with a partner computer chosen from said

plurality n of computers, so that no more than one computer PC_i is idle during said additional exchange ([0059], disclosure of nodes of parallel system operating in pairs to exchange data for processing).

a network system that n (n is any real number of 2) number of computers PC_i , (integer i represents the number of PC_i from 0 to $n-1$) are connected to a line concentrator or communications network that has a switching function, the data distribution method is characterized in that

each computer PC_i has a storage device that is responsible for storing data X_i (i is an integer from 0 to $n-1$) that is to be cross correlated, the data X_i noted above on each PC_i can be divided into n partial data $X_i(j)$ (j is an integer from 0 to $n-1$) ([0022], disclosure of nodes of parallel computing system with storage apparatus for holding portions of a data set), computer PC_k (k is an integer from 0 to $n-1$) is responsible for the cross correlation processing of partial data $X_i(k)$ located on each computer PC_i and further, in each pair including 2 computers which are connected to be able transmit data via the line concentrator or communications network noted above, mutually between 2 computers which are connected, the computer repeats steps that computers transmit their allocated partial data to the partner computer which is connected to said computer between each other ([0059], disclosure of nodes of parallel system operating in pairs to exchange data for processing).

Mikio fails to explicitly disclose where in more than one computer is idle during either the first or additional exchange steps.

However, Nickel discloses a distributed computing wherein all partner computers/node engage in non-idle activity during their assignment to a computing cluster ([0042]). Mikio and Nickel are analogous art because both are from the endeavor of distributed computing comprising networked PCs.

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Mikio because Nickel would extend the system to include generating productive work throughout data exchanges between partner computers.

Mikio fails to explicitly disclose that the network medium allows for full duplex communications.

However, Examiner takes Official Notice that full duplex network communication among computing entities was commonplace well prior to the time of the claimed invention and, as such, was an obvious feature for the parallel computing system disclosed in Mikio.

For claim 2, the combination of Mikio, Nickel and Official Notice discloses the data distribution method according to claim 1 wherein said step is repeated $n-1$ times if n is even and n times when if n is odd, and each cycle of the step is repeated only between

said pair of computers and a same pair of computers is allocated without overlapping through all of the steps (Mikio, [0059]).

For claim 5, the combination of Mikio, Nickel and Official Notice discloses the data distribution method according to claim 4 wherein the block of the turn (where n is an integer of 0 and more) includes partial data from n times to $(n \cdot \text{times}.. + n - 1)$ and the computer PC_k of the k turn is responsible for the cross correlation processing of partial data $X_i(k + n \cdot \text{times})$ located on each computer PC_i (Mikio, [0033], disclosure of turns feature).

For claim 6, the combination of Mikio, Nickel and Official Notice discloses the data distribution method according to claim 4 or 5 wherein said steps are applied to every block $n-1$ times if n is an even number, and n times if n is an odd number and each cycle of the step are repeated between the said pairs of computers assigned without overlapping, and all of the steps are repeated between said pairs assigned without overlapping (Mikio, [0022] and [0059]).

For claim 8, the combination of Mikio, Nickel and Official Notice discloses the data distribution method according to one of claims 1 to 7 that computers used in this method are general purpose computers (Mikio, [0023], disclosure of parallel system comprised of multiple processing entities).

For claims 9 and 15, the combination of Mikio, Nickel and Official Notice discloses a system as in any one of the preceding claims, comprising a network medium configured for full duplex communication (Official Notice).

For claim 10, the combination of Mikio, Nickel and Official Notice discloses the data distribution method according to one of claims 1 to 9 that data used in this method are time series data recorded from radio telescopes (Mikio, [0001], parallel computing by its very nature is concerned with handling complex problems involving enormous amounts of data).

For claim 16, the combination of Mikio, Nickel and Official Notice discloses the system of claim 1, wherein n is an odd number (Mikio, [0021], disclosure of computing node addressing comprising $[0 - 2n-1]$).

For claim 17, the combination of Mikio, Nickel and Official Notice discloses the system of claim 1, wherein $n=2^k + 1$, wherein k is an integer greater than 0 (Mikio, [0021], disclosure of computing node addressing comprising $[0 - 2n-1]$).

For claim 18, the combination of Mikio, Nickel and Official Notice discloses the system of claim 1, wherein $n=2^k - 1$, wherein k is an integer greater than 0 (Mikio, [0021], disclosure of computing node addressing comprising $[0 - 2n-1]$).

Response to Arguments

Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues prior art of record does not teach wherein no computer is left idle during data exchanges. Examiner disagrees. Nickel unambiguously discloses a system which completes productive work during data exchanges between computing entities ([0042]).

Applicant argues prior art of record does not teach multiple divisions of data. Examiner disagrees. Mikio unambiguously discloses a system wherein data to be processed by the cluster is sub-divided on more than on occasion ([0014-0016] and [0021]).

Applicant argues prior art of record does not teach a system that works with combinations other than 2^n computers. Examiner disagrees. Mikio ([0021], disclosure of computing node addressing comprising $[0 - 2^n - 1]$) teaches addressing regimes for cluster nodes which comprise an odd number of entities.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clayton R. Williams whose telephone number is 571-270-3801. The examiner can normally be reached on M-F (8 a.m. - 5 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Apr. 20, 2009
CRW
/ARIO ETIENNE/

Clayton R. Williams
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